Cost Analysis and Efficiency Indicators for Health Care

Report Number 4
Summary Output for 19 Primary Health Care Facilities in Alexandria, Bani Suef and Suez 1993-94

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Table of Contents

List of Graphs

List of Tables

Acronyms

CEA	Cost-Effectiveness Analysis
DALY	Disability Adjusted Life Year
DOP	Department of Planning
DDM	Data for Decision Making
L.E.	Egyptian Pound
MCH	Mother and Child Health Center
MOHP	Ministry Of Health and Population
PHC	Primary Health Care
PHCFs	Primary Health Care Facilities
PWAF	Present Worth of Annuity Factor
PV	Present Value
QALY	Quality Adjusted Life Years
RP	Reference Period
TC	Total Cost
UHC	Urban Health Center
na	Not available/not applicable

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Arabic Executive Summary

Executive Summary

The Governorates of Alexandria, Suez, Bani Suef, Aswan, Dakahlia, Port Said, North and South Sinai undertook detailed costing studies to define costs and efficiency in Ministry of Health and Population Primary Health Care Facilities(PHCF's). This study presents the results of nineteen PHCF's in the three Governorates of Alexandria, Suez and Bani Suef. The data collection and analysis were conducted by a team from the Health Directorates in cooperation with the Data for Decision Making project (DDM). DDM is a collaborative effort between the Department of Planning (DOP), Ministry of Health and Population (MOHP), United States Agency for International Development (USAID), the Harvard School of Public Health, and the University of California, Berkeley, School of Public Health.

The operating costs of the PHCFs from July 1993 to June 1994 were allocated to the individual cost centers. Five major categories of costs were selected to estimate the total costs: building and permanent structures, equipment and furniture, personnel, drugs and medical supplies, and utilities, including food and clothing.

The largest expenditure is for personnel. Personnel costs include take-home pay and all related benefits. Annual personnel costs in the individual PHCFs account for 19 to 82 percent of total costs with an average of 62 percent. See Table 1 for the annual costs of outpatient health facilities; see graph 1 for the average distribution of costs in outpatient health facilities.

On average, 22 percent of the total annual costs for 1993-1994 was spent on drugs and medical supplies. The total annual cost of drugs and medical supplies includes not only the drugs actually used, but also donated and wasted drugs. It does not include prescription drugs purchased out-of-pocket by patients. The cost of drugs and medical supplies varies significantly across PHCFs. The cost of drugs and medical supplies constitute 62 percent of expenditures on Ganayen Rural Health Unit(RHU), while they account for only 3 percent of the treatment for Zada RHU. See graph 2 for the cost of drugs per visit in outpatient health facilities. The cost of drugs per visit varies from less than L.E. 1 to L.E. 7, depending on the annual drug budget and utilization rate.

The average cost per visit is L.E. 11. Costs range from L.E. 3 for Arbeen UHC to L.E. 60 for Sedment RHU. See graph 3 for the total annual visits compared to the cost per visit. The cost per visit is highest in PHCFs with low utilization rates. Some outpatient health facilities (OHFs) were very well staffed; however, the utilization rate did not exceed one patient per physician per day, which leads to a high per visit cost. See graph 4 for annual visits per physician compared to cost per visit.

Recommendations: Improved management efficiency of most of these primary health care facilities will require an increase in utilization rates. Steps which need to be taken to achieve this goal include:

- Improving the infrastructure of primary health care centers. Except for a small number of remarkable units, the centers are generally not well maintained and not optimally cleaned. Maintenance budgets are non-existent or minuscule.

- Improving the technical efficiency of primary health care units so that each outpatient visit expends fewer inputs of personnel, particularly in those units such as Tazment where staff see few patients daily.

- Improving allocative efficiency by improving quality of care for a priority cost-effective package of services. This can be accomplished through upgrading the technical capacity of staff and supplies of diagnostics and drugs.

- Rationalizing drug supplies so that PHCFs have adequate supplies of a few essential drugs for priority benefit packages.

- Considering closing facilities in areas where many underutilized public and private sector facilities exist in close proximity.

- Developing treatment guidelines.

The current system of management at primary health care facilities splits responsibility between the governorate and the Ministry of Health and Population. This structure provides no incentive to improve management, quality, and efficiency. Changing the decision making system so that efficient, high quality care is rewarded will likely have the greatest impact. This change will require increased decision-making autonomy in the hospital regarding staffing patterns, maintenance budgets, and drug purchases, among other considerations. These changes might also lead to primary health care facilities increasing their accountability to provide efficient and client-oriented services. The role of the central and governorate level health administration would expand to the development of PHCF policy and monitoring, and assuring quality services.

I. Introduction

In Egypt, as in other developing countries, the demographic and epidemiological transition is putting increasing pressure on scarce government resources. Government spending on health care in Egypt, as a percentage of the gross domestic product, has remained fairly constant in the last decade. However, the role of the Ministry of Health and Population(MOHP) in financing health care in Egypt has declined as a proportion of total health spending. The budget tracking system of the Department of Planning has demonstrated that scarce health resources are allocated towards services which are costly and result in limited benefits in terms of increased life expectancy. Only 5 percent is allocated to primary care services which are known to be most cost-effective. Under these circumstances, the challenge facing policy makers is to optimize returns on investments in health care.

Two major avenues for increasing health benefits from scarce resources are 1) increasing the efficiency and improving the management of existing health facilities and health programs and 2) increasing the allocation of resources to those programs that are most cost-effective. In order to increase the use of scarce resources for more cost-effective and efficient services, the Ministry of Health and Population undertook a cost-effectiveness exercise.

Cost-Effectiveness is a method for identifying interventions that achieve the greatest level of health impact per unit of expenditure. Effectiveness is typically measured in terms of improvements in health status. An important aspect of cost-effectiveness analysis is that it can be used to assess efficiency.

To define costs and efficiency in hospitals, the Governorates of Alexandria, Suez and Bani Suef, undertook detailed costing studies. This study presents results for the costing of 19 outpatient health facilities in Alexandria, Suez and Bani Suef Governorates. The data collection and analysis was conducted by teams from health directorates in cooperation with the Data for Decision Making project (DDM). The DDM project is a collaborative effort between the Department of Planning (DOP), Ministry of Health and Population (MOHP), United States Agency for International Development(USAID), Harvard University School of Public Health, and the University of California Berkeley, School of Public Health.

Efficiency indicators point to significant inefficiencies. On average, 60 percent of the expenditures in PHCFs are for salaries of personnel, leaving less than optimal resources for drugs and medical supplies. The analysis shows that with better allocation of resources (human and financial), major efficiency gains can be achieved.

A. Why Hospital Costing and Efficiency Indicators for Bani Suef General Hospital?

The main objectives of the cost and allocative efficiency study of the primary health care units are to:

- Developing a clear and appropriate methodology for calculating the service cost;
- Increasing the technical capability of professionals at the governorate in undertaking costing studies and using the information for decision making;
- Estimating the actual economic costs of services delivered by each medical department of the hospital;
- Increasing the efficiency of resource use by not only understanding the cost of services under the current operating system, but also providing some understanding of how resources can be used to provide the optimal level of service;

- Creating a basis for a pricing system of medical services delivered by the hospital that can be used to establish fees for services and contracts.

B. Use of Data to Detect Inefficiencies in Resource Allocation and Identify Strategies to Improve Them

There are at least two ways in which data from the primary health care facilities can be used to identify areas of inefficiencies, which can lead to developing strategies to deal with these issues.

1. Comparing the Range of Costs Among Facilities

By comparing results of the various facilities, the range of costs for outpatient and inpatient services becomes evident and reasons for the differences can be better analyzed: low utilization, high administrative costs, differences in personnel staffing, differences in equipment and maintenance budgets, etc. Strategies can then be developed to treat the identified problems which may include increasing utilization of under-utilized facilities, changing staffing patterns or closing underutilized facilities.

2. Comparing Actual and Normative Costs

Normative costs are the costs of providing services at an appropriate level of high quality. Actual costs are the costs of providing services in the field. These may differ substantially from normative costs. The reasons for norms of care can be set by MOHP or another decision making body. However, since the ideal staffing pattern, equipment, building size and budgets are likely not known, this norm can approximated by a) using the current MOHP estimated building costs for new facilities, the equipment and maintenance budgets and staffing patterns; b) if these estimates are not available, the costs of a well-fun facility can be used; and c) using advice from technically knowledgeable experts. These normative costs for building, staff, equipment, maintenance and utilities are compared with the actual costs calculated from the facilities inventoried. By noting differences between the normative and actual costs, the MOHP can develop strategies to adjust the costs of services closer to the norm.

C. Description of Primary Health Care System

Egypt was one of the first of the developing countries to introduce broad community-based health projects. In recent years, however, it has suffered from not having a clear strategy and providing no significant investment.

The Ministry of Health and Population oversees a large system of health centers: rural health centers, rural health units, urban health centers and units, Mother and Child Health Centers (MCH) and other units (3179) to provide primary care services. These facilities provide an integrated set of basic services, including maternal and child health, school health care, anemic and parasitic disease control, communicable disease control, environmental sanitation, health education, curative and emergency care, and vital health registration. The Ministry of Health and Population (FY 1990-91) spent only 5 percent of the total annual budget on primary health care while allocating 80 percent for curative care and administration (Budget Tracking System, MOHP, DOP, 1996). The MOHP needs to reallocate the existing resources in order to improve the general performance of the health system.

Primary health care services are mainly provided by Rural Health Units (RHUs), Rural Health Centers (RHCs) and Rural Hospitals. A variety of institutions, namely Urban Health Centers (UHCs), School Health Services (SHSs), Comprehensive Clinics, Endemic Disease Units,

Mother and Child Health(MCH) Centers and Health Offices, provide various components of primary health care to the urban population.

Rural Health Units and Centers: The principle functions of these health institutions are: MCH, family planning(FP) services, school health services, control of endemic and communicable disease, environment health services, health education and information, and curative and emergency medical care. Some of the Rural Health Units and Rural Health Centers provide dental services. Inpatient facilities, with an average of 15 beds, are available in the health centers.

Urban Health Centers: These centers do not have inpatient facilities because of easy access to hospitals in urban areas. However, all UHCs have dental clinics.

Mother and Child Health Centers: These are mainly concerned with MCH and family planning services. However, many of the MCH centers provide dental services to mothers and children.

II. Methods of Cost Analysis of Primary Health Care

A. Cost Allocation Among Cost Centers

Total costs consist of recurrent costs and the discounted present value of capital costs. These are allocated directly to the cost centers. A manual of cost-effectiveness analysis was prepared in English by the DDM project at Harvard. In order to make it more accessible to governorate-level staff the manual has been translated into Arabic. Copies of the field-tested forms for data collection are included in the annex. In addition, a manual on data collection was prepared in Arabic.

Data collection and analysis was conducted by teams from the Health Directorates in collaboration with the costing team of the DDM project. The selection method for the health facilities sample for Phase One depended on two main criteria: the availability of data and the cooperation of the teams at the health facilities.

Data collected for cost estimation were grouped under five broad categories: major and minor equipment, building and permanent structures, labor (personnel costs), utilities, drugs and medical supplies.

Capital costs are the annual costs of resources that have a life expectancy of more than one year. They include depreciated annual costs for building, equipment and furniture. The study uses replacement cost for capital items, which is the cost of the item if it were to be replaced at current market price. The study was conducted between 1 July 1993 to 30 June 1994, which was the data collection period for costing the primary health care facilities. The costs of buildings and equipment are depreciated to the unified accounting method currently practiced in Egypt, with 25 years useful life being used for the buildings.

Recurrent costs are costs associated with inputs that will be consumed or replaced in one year or less, such as personnel salaries, training (refresher courses), drugs, food and utilities.

B. Cost Categories

Capital Cost

(1) Annual Depreciation Costs for Equipment And Furniture

The Study used the replacement cost of equipment and furniture established during the reference time, July 1, 1993 to June 30, 1994. (See Annex V for the data collection sheet for equipment.) Six categories of equipment and furniture, each with a secondary categorization of 2, 3, 5, 10 , 15 and 20 working life years, were assessed. This categorizing system was designed with the assistance of MOHP experts in the field of medical supplies who are familiar with the actual productive lifetime for equipment and furniture in Egypt. The system is based on the level of maintenance and the frequency of use of the equipment.

The number of units of equipment and furniture and their locations were obtained through physical inventory and technical description in log books no. 118, 112, 121. See tables for equipment and furniture cost for each primary health care facility. The tables show total cost of equipment and annual depreciation cost.

(2) Annual Depreciation Costs for Buildings.

The study used the replacement cost for the building during the reference time, and was calculated using L.E. 575 per sq. meter. These figures were obtained from the DOP at the MOHP, which is responsible for budget allocation to establish and renovate health facilities in the different governorates. The building costs are depreciated using an effective life of 25 years. The cost of the land has not been included in this estimation.

Floor space assigned to each department includes space within the department and an allocation of the special corridors (space located between cost centers) and general corridors (space outside the cost centers). This data was collected by preparing a floor plan of the hospital, identifying and categorizing rooms to their activities, and estimating the size of each room and corridor. The information about building characteristics was obtained from the engineering (maintenance) department.

The base cost center space and the total space for each cost center after allocating special and general corridors are presented in the tables. They also show the total cost of the building for each cost center and the annual depreciation cost using 25 years as useful life and 3% for the Present Worth Annuity Factor(PWAF).

Recurrent Costs

(1) Annual Personnel Cost

Staff are allocated to five categories (see table 3 for personnel allocation):

1. Physicians: Includes all medical doctors working at the PHCF in addition to dentists. Pharmacists are not included in this category.

2. Nurses: Includes all nurses who graduated either from the high school of nursing or from the high institute of nursing.

3. Technicians/ skilled personnel: Includes personnel with a university degree or some special skill in his/her field of work. It includes lab technicians, dietitians in the kitchen, pharmacists and drivers for vehicles or ambulances.

4. Administration: Includes personnel performing administrative work.

5. Unskilled personnel: Includes all janitors and messengers.

The annual personnel cost includes the "total pay" for each person working at the hospital as well as the following:

- Take-home pay.

- Benefits (including exceptional honoraria and family planning), health insurance contributions, labor day allowance, feast honoraria, pay for working over night, free accommodation and food for doctors and nurses.

- Deductions such as insurance, pension and income tax.

The numbers shown in the personnel column are equal to the full time equivalent personnel working at each cost center. Data on personnel salaries were collected from sheet no. 50 A. H. at the governorate level. Cost analysis shows that overall 62 percent of annual PHCF expenditures was spent on personnel.

(2) Annual Utility Cost

This category includes electricity, water and maintenance. Data on the cost of utilities were obtained from the financial department and the official records of invoices. Table 4 shows the annual cost of utilities for each PHCF. Cost analysis shows that on average 0.9 percent of annual primary health care facility expenditure was spent on annual utilities cost. See tables for the annual facilities cost and their allocation to cost centers at each primary health care facilities.

(3) Annual Cost of Drugs and Medical Supplies

This category includes drugs and medical supplies provided by the PHCFs. It does not include prescribed drugs that patients purchase outside of the PHCFs. Table 4 shows the total annual cost of drugs and medical supplies in each PHCF. The study used the price list of the Drugs and Medical Supplies Department at MOHP for purchasing drugs and medical supplies for health facilities. Data related to drugs and medical supplies consumed by the final services departments were collected from Pharmacy or Store cost centers. Cost analysis shows that on average 22 percent of annual PHCF facilities expenditure were spent on drugs and medical supplies cost. ****See tables for the annual cost of drugs at each of the primary health care facilities.

III A. Comparative Results of the Nineteen Facilities.

Table 1 summarizes the 19 primary health centers. Included in the study were Rural Health Centers, Rural Health Units, Urban Health Centers and Maternal and Child Health Units. They were distributed geographically in Suez, in Bani Suef and in Alexandria Governorates.

The average annual cost for the primary health care units is L.E. 177,559. Personnel costs account for 62 percent while drugs costs absorb 22 percent. The average cost per visit is L.E. 11. Bani Suef Governorate has the highest cost per visit at L.E. 27, followed by L.E. 16 in Alexandria Governorate and L.E. 7 per visit in Suez Governorate. The average cost of a visit at Maternal and Child Health Centers (MCH) is the highest at L.E. 34., followed by 27 at rural health centers (RHCs), and L.E. 13 at rural health units (RHUs). Urban health centers (UHCs) are the least costly at L.E. 11. Graph 6 displays the distribution of visit costs.

The cost per visit is determined by dividing the total costs of the facilities by total outpatient visits in the reference year. This attributes all costs to outpatients visits; however, some of the personnel in some facilities spend part of their time on other health related activities described in Section IC. We did not determine the exact percentage of staff time used for these activities; however, in field interviews it was obvious that these responsibilities were a small proportion of staff time.

Graph 3 demonstrates that the single most important determinant of cost per visit is the number of annual outpatient visits. It varies between L.E. 3 and L.E. 90. In the units with the highest cost per visit (Sedment, Omara, Moharam Bek) physicians see 1 to 4 patients per day, and the nurses see an average of 1 patient per day. This compares with Amer where physicians see 30 patients per day on average and the nurses see 7 patients. This is the second highest nurse productivity facility after Arbeen where the nurses attend to 11 patients daily.

The personnel costs vary widely between 19 and 82 percent of the total annual cost. Nurses receive 27 percent of the total personnel cost with an average monthly salary of L.E. 148., followed by physicians with 25 percent of the total personnel cost and an average monthly salary of L.E. 175.

Administrative and technical personnel categories each contribute 17 percent of the total annual cost with 13 percent allocated to unskilled personnel. Skilled personnel generate 1 percent of the annual costs of personnel. Table 3 shows the average costs of personnel.

On the governorate level, personnel costs in Alexandria Governorate account for 72 percent of the total annual cost of the PHCFs. They are followed by 66 percent for personnel at Bani Suef Governorate and 48 percent for the Suez Governorate. Graph 11 shows the personnel and drugs cost by governorate. Physicians in Alexandria receive 31 percent of the personnel cost followed by 23 percent for nurses. The unskilled personnel in Bani Suef Governorate receive the highest proportion at 25 percent of the annual personnel cost, followed by 24 percent for nurses, and 9 percent for physicians. Nurses in Suez Governorate receive the highest percentage of the annual personnel cost, reaching 34 percent while physicians receive 16 percent. See graph 7 for the distribution of personnel cost by governorate.

As noted in the cost analysis of the general, fever and chest hospitals in Alexandria, Bani Suef and Suez, Bani Suef has the lowest proportion of physicians on its staff in the public sector hospitals and PHC facilities assessed. It has the largest proportion of technicians and unskilled staff. Alexandria has the largest proportion of physicians. This staffing difference occurs despite a salary incentive for physicians to work in Bani Suef. Suez has the highest annual visits per staff. Of all 6 facilities, more than 300 annual patient visits per staff (see Graph 10) are in Suez. Suez has the most efficient staffing pattern of all the governorates.

Personnel expenses at RHCs absorb more than 75 percent of the total annual expenditures. MCHs allocate 71 percent of total annual expenditures for personnel, followed by 64 percent at urban health centers and 54 percent at rural health units.

Cost per visit varies between L.E. 3 and 60. Graph 9 shows the relationship between cost per visit and personnel cost per visit. The personnel cost per visit varies from L.E. 38 in Sedment RHU and L.E. 1 in Arbeen UHC. Physicians in Sedment RHU receive only 5 percent of the personnel cost for a visit, while 95 percent of personnel cost goes to nurses and other personnel at the unit. See graph 10 for annual visits per staff compared to cost per visit.

The overall average drug cost per visit is L.E. 2.47, varying between L.E. 7 in Shamandora RHU and L.E. 0.53 at Zada RHU. Graph 2 shows that there is no distinct relationship between the increase of the drug cost per visit and total annual visits. In Arbeen UHC, which represents the highest utilization rate(65,747 annual visits), the patient receives drugs at the cost of L.E. 0.87 per visit, while in Shamandora RHU patients get drugs costing L.E. 7. This suggests that there are other factors affecting the utilization rate other than the availability of drugs. Availability of physicians could be one of these influencing factors. This low cost means that few drugs are dispensed to patients and many patients must purchase drugs outside pharmacies.

Graph 2 also shows that 25 percent of the outpatient visits include drugs with an average cost of less than L.E. 1, and 85 percent receive drugs at less than L.E. 3. Only 5 percent of visits include drugs costing more than L.E. 7.

On the governorate level, Suez allocates 34 percent of the total annual cost of the PHCFs to drugs, followed by Alexandria at 19 percent. Bani Suef Governorate allocates only 4 percent of the annual primary health care facilities costs to drugs. Graph 11 displays the percentage of annual cost for personnel and drugs by governorate.

Rural Health Units allocate 29 percent of annual expenditures to drug costs while Urban Health Centers allocate 22 percent, followed by 15 percent at the MCHs. Rural Health Units allocate only 4 percent of the total annual expenditure for drugs. See Table 1 for the annual costs of primary health care facilities.

The average annual number of visits per physician is 1,205. The highest number of visits per day per physician is 30 in Amer RHU, and lowest at 1 visit per physician in Moharam Bek MCH. The average number of daily visits per physician is 4. Graph 10 demonstrates that the average number of visits per staff is 262. Since there are more than 260 working days in a year, the number of staff visits per day is less than 1.

The highest annual number of visits to physicians is at the RHUs, reaching 4,383 visits on average, followed by 1,801 for RHCs, 1,462 for UHCs and the least number of annual visits per physician at MCHs is 307 visits. Graph 12 shows the average number of annual visits per physician and nurses in the different types of primary health care facilities. MCH physicians and nurses see the least number of annual visits.

In Suez Governorate the highest annual number of visits to physicians is 2,583 visits, followed by 1,445 visits at Bani Suef Governorate and the least (567) at Alexandria Governorate. The last figure demonstrates over-staffing of physicians at Alexandria Governorate. Graph 13 displays the annual number of visits per physician and nurse for each governorate. Average annual visits per nurse in Bani Suef Governorate are the least number with an average of 538 visits per year, suggesting the over-staffing of nurses within that governorate.
Analysis of staffing patterns and utilization rates shows that there is no link between the number of physicians and the annual number of visits. Moharam Bek MCH has 59 physicians with 13, 394 annual visits, while 15 physicians at Arbeen UHC deliver 65,747 annual visits. Graph 14 shows the relationship between total annual visits and total number of physicians.

Utilization rates at Urban Health Centers are the highest with an average of 49,342 annual visits, followed by 8,659 visits for rural health units, 6,759 visits for MCHs and only 4,504 visits for rural health centers.

IIIB. Individual Results of Primary Health Care Facilities

Name of health facility: Tazment

Type of health facility: Rural Health Center

Governorate: Bani Suef

See tables: 6,7,8,9,10, 11 and 12

Cost Analysis

- Total annual cost: L.E. 161,094
- Cost per visit: L.E. 25
- Annual cost of personnel: L.E. 131,378 (82% of total annual expenditure)
- Annual cost of drugs and medical supplies: L.E. 6,750 (4% of total annual expenditure)

Efficiency Indicators

- Annual visits: 6,400
- Annual number of visits per physician: 2,133
- Average number of visits per physician per day: 8
- Annual number of visits per staff: 110

PHCF Staff

- Total number of staff: 58
- Number of physicians: 3, accounting for 5 % of total annual personnel expenditures
- Number of Nurses: 19, accounting for 34% of total annual personnel expenditures

Tazment Rural Health Center spends most of its annual expenditures on personnel (80%). See Table 2 for the distribution of visit cost by category. This percentage is the highest of the 19 outpatient health facilities. The reason for this high personnel expenditure is the large number of staff (58 personnel), most of whom are nurses and unskilled personnel and who account for 54 percent of the total annual expenditure for personnel. The total number of physicians is 3, accounting for only 5 percent of the annual personnel expenditure. See Table 10 for personnel costs. As a result of the low utilization rate (6,400 visits per year), the cost per visit reaches L.E. 25. See Graph 5 for daily outpatient visits per physician. The average number of visits per physician per day is 8 visits, which are very low compared to the Amer Rural Health Unit. The average number of visits per nurse per day is 1.2. The patient receives drugs equivalent to 4.19 percent of the total cost of the visit, which has a value of L.E. 1. This low drug cost per visit represents an inadequate supply of drugs. As a result, patients often purchase drugs on the market.

The following steps would increase the efficiency of Tazment RHC:

- Increasing the utilization rate.

- Decreasing the number of staff, especially nurses (19 nurses account for 33 percent of the personnel budget), unskilled personnel (14) and administrative personnel (12).

- Increasing the budget for drugs and medical supplies to increase the quality of care and utilization rate.

Name of health facility: Kay

Type of health facility: Rural Health Center

Governorate: Bani Suef

See tables: 13,14,15,16,17, 18 and 19

Cost Analysis

- Total annual cost: L.E. 78,654

- Cost per visit: L.E. 30

- Annual cost of personnel: L.E. 51,273 (65% of total annual expenditure)

- Annual cost of drugs and medical supplies: L.E. 2,916 (4% of total annual expenditure)

Efficiency Indicators

- Annual visits: 2,607

- Annual number of visits per physician: 1,304

- Average number of visits per physician per day: 5

- Annual number of visits per staff: 113

PHCF Staff

- Total number of staff: 23

- Number of physicians: 2, accounting for 8 % of total annual personnel expenditures

- Number of Nurses: 4, account for 19% of total annual personnel expenditures

The cost per visit at Kay RHC reaches L.E. 30. Again, the large number of personnel and low utilization rates lead to a high cost per visit. Kay RHC absorbs L.E. 3 for each visit from the depreciated cost of equipment. This is considered to be the highest cost compared with other PHCFs. It is not the highest in terms of percentage (9%), as Mosals MCH spends 11% of total annual expenditure on annual depreciation cost of equipment. Drugs and medical supplies accounted for only 4% of the total annual expenditure, which is equal to L.E. 1 per visit.

The number of visits per physician is 1, 304, or 5 patients per day, and the average number of visits per nurse per day is 2.

To increase the efficiency of Kay RHC:

- Increase the utilization rate.
- Increase the budget for drugs and medical supplies to increase the utilization rate.
- Decrease the number of personnel, since more than 50% of the annual budget is spent on administrative and unskilled personnel.

Name of health facility: Gon

Type of health facility: Rural Health Unit

Governorate: Alexandra

See tables: 20, 21, 22, 23, 24, 25 and 26

Cost Analysis

- Total annual cost: L.E. 312,860
- Cost per visit: L.E. 11
- Annual cost of personnel: L.E. 224,399 (72% of total annual expenditure)
- Annual cost of drugs and medical supplies: L.E. 68,906 (22% of total annual expenditure)

Efficiency Indicators

- Annual visits: 27,344
- Annual number of visits per physician: 804
- Average number of visits per physician per day: 3
- Annual number of visits per staff: 249

PHCF Staff

- Total number of staff: 110
- Number of physicians: 34 accounting for 43 % of total annual personnel expenditure
- Number of Nurses: 26 accounting for 19% of total annual personnel expenditure

The cost per visit in Gon Rural Health Unit is L.E. 11. Of this amount, L.E. 8 goes to personnel (account for 72%). See Table 2 for the distribution of visit cost by category. There are 34 physicians, whose salaries account for 43% of the total annual personnel expenditures. Each physician sees only 3 patients per day. There are a total of 26 nurses, which is much less than the number of physicians. The drug costs represent 22% of the total annual expenditure. This

may sound quite high, but as the number of total visits in Gon goes as high as 27,344 visits per year, the cost of drugs per visit will be equal to an average of only L.E. 2.5.

To increase efficiency of Gon RHU:

· Increase the annual budget for drugs and medical supplies

· Decrease the number of physicians. Assuming an optimal number of 30 visits per day per physician as in Amer RHU, Gon RHU needs only 3.37 physicians. This means that it needs to decrease the number of physicians by 90 percent.

Name of health facility: King Mariot

Type of health facility: Rural Health Unit

Governorate: Alexandria

See tables: 27, 28, 29, 30, 31, 32 and 33

Cost Analysis

· Total annual cost: L.E. 89,879

· Cost per visit: L.E. 16

· Annual cost of personnel: L.E. 47,426 (53% of total annual expenditure)

· Annual cost of drugs and medical supplies: L.E. 31,268 (35% of total annual expenditure)

Efficiency Indicators

· Annual visits: 5,502

· Annual number of visits per physician: 804

· Average number of visits per physician per day: 3

· Annual number of visits per staff: 249

PHCF Staff

· Total number of staff: 24

· Number of physicians: 3, accounting for 19% of total annual personnel expenditures

· Number of Nurses: 8, accounting for 28% of total annual personnel expenditures

The cost per visit at King Mariot Rural Health Unit is L.E. 16. This high cost per visit is a result of low utilization (5,502 visit per year), which results in :

- Each visit including drugs costing L.E. 6. This is one of the highest drugs costs per visit.

- Elevating personnel costs to L.E. 9 per visit.

To increase efficiency of King Mariot RHU:

· Increase the utilization rate.

· Decrease the number of personnel to match the low utilization rate. Compared with an example of an optimal number of visits per personnel (853 visits in Amer RHU), Kind Mariot needs only 5 personnel out of these 24 to match the current utilization rate. See Table 4 for personnel output.

Name of health facility: Amer

Type of health facility: Rural Health Unit

Governorate: Suez

See tables: 34, 35, 36, 37, 38, 39 and 40.

Cost Analysis

· Total annual cost: L.E. 156,089

· Cost per visit: L.E. 10

· Annual cost of personnel: L.E. 39,213(25% of total annual expenditure)

· Annual cost of drugs and medical supplies: L.E. 92,631(60% of total annual expenditure)

Efficiency Indicators

· Annual visits: 16,205

· Annual number of visits per physician: 8,103

· Average number of visits per physician per day: 30

· Annual number of visits per staff: 853

PHCF Staff

· Total number of staff: 19

· Number of physicians: 2 accounting for 12 % of total annual personnel expenditures

· Number of Nurses: 9 accounting for 43% of total annual personnel expenditures

Based on the following criteria, Amer Rural Health Unit is considered one of the most efficient PHCF Units compared to other PHC Units in this study:

· Personnel salaries account for only 25% of the total annual expenditures. This is directly related to the lower number of personnel compared to other PHC Units.

- Annual number of visits per physicians is 8,103 with an average of 30 visits per day. This is one of the highest rates. See table 5 for personnel output.

- The cost of drugs per visit is L.E. 6, while the cost of personnel per visit is only L.E. 3. This is one of the few examples in which the drug cost is double the personnel cost per visit.
- Number of visits per staff is 853, representing the highest rate.

- Drugs account for 59% of the total annual expenditures with an average of L.E. 6 per visit for drugs.

Name of health facility: Ganayen

Type of health facility: Rural Health Unit

Governorate: Suez

See tables: 41, 42, 43, 44, 45, 46 and 47

Cost Analysis

- Total annual cost: L.E. 124,799

- Cost per visit: L.E. 11

- Annual cost of personnel: L.E. 23,132 (19% of total annual expenditure)

- Annual cost of drugs and medical supplies: L.E. 76,840 (62% of total annual expenditure)

Efficiency Indicators

- Annual visits: 11,720

- Annual number of visits per physician: 3,907

- Average number of visits per physician per day: 14

- Annual number of visits per staff: 451

PHCF Staff

- Total number of staff: 26

- Number of physicians: 3 accounting for 11 % of total annual personnel expenditures

- Number of Nurses: 12 accounting for 34% of total annual personnel expenditures

Ganayen Rural Health Unit is considered as one of the most efficient PHC units as a result of the following:

- Drugs account for 62% of total annual expenditures.

- For each visit, the patient receives drugs costing L.E. 7 on average.

- The personnel budget accounts for 19% of the total annual expenditure, the lowest percentage compared to other PHC units.

- The cost of drugs per visit is L.E. 7, while the cost for personnel is only L.E. 2. Again, this is one of the few examples where drugs cost more than three times the cost of personnel.

To increase the efficiency of Ganayen RHU:

- Increase the utilization rate.

- Decrease the number of personnel. In spite of the fact that the annual personnel expenditure is quite low here, the total number of personnel (26) is still too high, resulting in a sharp decrease in the units efficiency. An example is the high number of nurses (12) in this unit.

Name of health facility: Shamandora

Type of health facility: Rural Health Unit

Governorate: Suez

See tables: 48, 49, 50, 51, 52, 53 and 54

Cost Analysis

- Total annual cost: L.E. 55,099

- Cost per visit: L.E. 27

- Annual cost of personnel: L.E. 17,223 (31% of total annual expenditure)

- Annual cost of drugs and medical supplies: L.E. 14,973(27% of total annual expenditure)

Efficiency Indicators

- Annual visits: 2,067

- Annual number of visits per physician: 1,034

- Average number of visits per physician per day: 4

- Annual number of visits per staff: 207

PHCF Staff

- Total number of staff: 10

- Number of physicians: 2, accounting for 25 % of total annual personnel expenditures

- Number of Nurses: 2, accounting for 18% of total annual personnel expenditures

Although the total annual expenditure at Shamandora RHU is the lowest figure at L.E. 55,099 (see Table 4 for the annual cost of outpatient health facilities), the cost per visit is quite high(L.E. 27) because the utilization rate is low. Additionally, the low utilization rate leads to a low daily number of visits, averaging 4 visits per physician. As a result of the large size of the building,

the annual depreciation cost of the building represents 31% of the total annual expenditure, which is one of the highest rates for a primary care unit.

Name of health facility: Gabalyat

Type of health facility: Rural Health Unit

Governorate: Suef

See tables: 55, 56, 57, 58, 59, 60 and 61.

Cost Analysis

- Total annual cost: L.E. 110,209
- Cost per visit: L.E. 8
- Annual cost of personnel: L.E. 49,345 (45% of total annual expenditure)
- Annual cost of drugs and medical supplies: L.E. 35,845 (33% of total annual expenditure)

Efficiency Indicators

- Annual visits: 13,680
- Annual number of visits per physician: 2, 280
- Average number of visits per physician per day: 8
- Annual number of visits per staff: 489

PHCF Staff

- Total number of staff: 28
- Number of physicians: 6, accounting for 29% of total annual personnel expenditures
- Number of Nurses: 10, accounting for 24% of total annual personnel expenditures

The cost per visit at Gabalyat Rural Health Unit is L.E. 8. This relatively low visit cost is the result of a low personnel costs, accounting for 45 percent of the annual total expenditures. See Table 3 for personnel costs. There is a total of 6 physicians, who have an average of 8 visits per day. The annual percentage of drugs is 33% of the total annual expenditure(more than in Arbeen UHC), but because of low utilization rates for Gabalyat RHU, the cost of drugs is L.E. 3 per visit.

To increase the efficiency of Gabalyat RHU:

- Decrease the number of personnel, especially the number of physicians and nurses.
- Increase the utilization rate.

Name of health facility: Mamalik

Type of health facility: Rural Health Unit

Governorate: Bani Suef

See tables: 62, 63, 64, 65, 66 and 67

Cost Analysis

- Total annual cost: L.E. 60,011
- Cost per visit: L.E. 21
- Annual cost of personnel: L.E. 36,850 (62% of total annual expenditure)
- Annual cost of drugs and medical supplies: L.E. 1,712 (3% of total annual expenditure)

Efficiency Indicators

- Annual visits: 2,878
- Annual number of visits per physician: 2,878
- Average number of visits per physician per day: 11
- Annual number of visits per staff: 169

PHCF Staff

- Total number of staff: 17
- Number of physicians: 1, accounting for 10 % of total annual personnel expenditures
- Number of Nurses: 2, accounting for 13% of total annual personnel expenditures

In spite of the very low utilization rate, the patients at Mamlik RHU receive average drugs costing L.E. 0.53 per visit, which represents one of the lowest costs in all PHC Units. Again, the low utilization rate leads to a high personnel cost reaching L.E. 13 per visit. See graph 4 for annual visits per staff against cost per visit. The unit has only one physician and the daily number of visits per physician is only 11. One of the main reasons for this low utilization rate is the unavailability of drugs.

To increase the efficiency of Mamalik RHU:

- Increase the supply of drugs.
- Decrease the number of personnel, especially administrative and unskilled staff.

Name of health facility: Sedment

Type of health facility: Rural Health Unit

Governorate: Bani Suef

See tables: 68, 69,70,71, 72, 73 and 74

Cost Analysis

- Total annual cost: L.E. 56,488
- Cost per visit: L.E. 60
- Annual cost of personnel: L.E. 35,498(63% of total annual expenditure)
- Annual cost of drugs and medical supplies: L.E. 3,289(6% of total annual expenditure)

Efficiency Indicators

- Annual visits: 942
- Annual number of visits per physician: 942
- Average number of visits per physician per day: 3
- Annual number of visits per staff: 59

PHCF Staff

- Total number of staff: 16
- Number of physicians: 1 accounting for 5 % of total annual personnel expenditures
- Number of Nurses: 4 accounting for 32% of total annual personnel expenditures

The utilization rate at Sedment Rural Health Center is the lowest in this study, at 942 visits per year. The low utilization leads to the highest cost of L.E. 60 per total annual budget. The number of annual visits per staff is 59, one of the lowest rates. The cost of personnel is L.E. 37.68 per visit. See Graph 9 for the cost per visit against personnel costs per visit. Physicians account for only 5% of the latter cost, while the other 15 non-physicians account for the remaining 95% of the cost of personnel per visit.

To increase the efficiency of Sedment RHU:

- Increase drug supplies.
- Increase the utilization rate.
- Decrease the number of personnel.

Name of health facility: Omara

Type of health facility: Rural Health Unit

Governorate: Bani Suef

See tables: 75,76,77,78,79, 80 and 81

Cost Analysis

- Total annual cost: L.E. 56,240
- Cost per visit: L.E. 57
- Annual cost of personnel: L.E. 33,556 (60% of total annual expenditure)
- Annual cost of drugs and medical supplies: L.E. 1,791(3% of total annual expenditure)

Efficiency Indicators

- Annual visits: 990
- Annual number of visits per physician: 990
- Average number of visits per physician per day: 4
- Annual number of visits per staff: 58

PHCF Staff

- Total number of staff: 17
- Number of physicians: 1 accounting for 2% of total annual personnel expenditure
- Number of Nurses: 3 for 18% of total annual personnel expenditure

The cost per visit in Omara Rural Health Unit is L.E. 57, representing the second highest visit cost after Sedment RHU. The utilization rate is 990, one of the lowest utilization rates, with an average of 58 annual visits per staff. Again, this is the lowest rate in all PHCF Units. The annual budget for drugs accounts for only 3% of the annual expenditure, while personnel costs account for 60%. Physicians receive only 2% of the annual personnel expenditure, while the other 16 staff receive the remaining 98%. See Table 3 for personnel costs.

To increase the efficiency of Omara RHU:

- Increase the budget for drugs.
- Increase the utilization rate.
- Decrease the number of staff.

Name of health facility: Zada

Type of health facility: Rural Health Unit

Governorate: Bani Suef

See tables: 82,83,84,85,86,87 and 88.

Cost Analysis

- Total annual cost: L.E. 105,853
- Cost per visit: L.E. 20
- Annual cost of personnel: L.E. 55,517 (53% of total annual expenditure)
- Annual cost of drugs and medical supplies: L.E. 2,806 (3% of total annual expenditure)

Efficiency Indicators

- Annual visits: 5,258
- Annual number of visits per physician: 2, 629
- Average number of visits per physician per day: 10
- Annual number of visits per staff: 210

PHCF Staff

- Total number of staff: 25
- Number of physicians: 2, accounting for 12 % of total annual personnel expenditures
- Number of Nurses: 4, accounting for 17% of total annual personnel expenditures

The cost of drugs per visit at Zada RHU is L.E. 0.53. This is the lowest cost of drugs per visit in all PHCF units. The annual budget for drugs is only 3 percent of the total annual budget of the unit. See graph 10 for the percentage of drugs cost per visit in outpatient health facilities. The annual depreciation cost of the building is 42 percent of the total annual expenditure, which is the highest rate of all units. The cost per visit is very high due to the following factors:

- Large number of personnel.
- Low utilization rate because of the low drug budget.
- High annual depreciation cost of the building.

To increase the efficiency of Zada RHU:

- Increase the budget for drugs.
- Decrease the number of staff.

Name of health facility: Kabary

Type of health facility: Urban Health Center

Governorate: Alexandria

See tables: 89,90,91,92, 93,94 and 95

Cost Analysis

- Total annual cost of the PHC: L.E. 692,382
- Cost per visit: L.E. 14
- Annual cost of personnel: L.E. 517,687 (75% of total annual expenditure)
- Annual cost of drugs and medical supplies: L.E. 105,417(15% of total annual expenditure)

Efficiency Indicators

- Annual visits: 50,155
- Annual number of visits per physician: 678
- Average number of visits per physician per day: 3
- Annual number of visits per staff: 184

PHCF Staff

- Total number of staff: 273
- Number of physicians: 74 accounting for 24% of total annual personnel expenditures
- Number of Nurses: 49 accounting for 21% of total annual personnel expenditures

Kabary Urban Health Center has the highest number of staff (273), the highest annual expenditures (L.E. 692,382), and one of the highest utilization rates (50,155 visits per year). However, the high number of staff does not match the utilization rate. The number of physicians is also very high(74), resulting in only 3 visits per day per physician. There are 49 nurses, which is less than the number of physicians. In spite of the high utilization rate, the cost per visit is still high at L.E. 14 because of the high cost of personnel at 75% of the annual budget. See Table 2 for the distribution of visits by category. Compared to the number of staff and the utilization rate at Amer RHU, Kabary UHC needs only 58 personnel, which is 21% of the current staff, including 6 physicians (8 percent of the current number of physicians).

To increase the efficiency of Kabary UHC:

- Decrease the number of staff by 79 percent. The center needs only 6 physicians.
- Increase the budget for drugs.

Name of health facility: Arbeen

Type of health facility: Urban Health Center

Governorate: Suef

See tables: 96,97,98,99,100, 101 and 102

Cost Analysis

- Total annual cost: L.E. 183,095
- Cost per visit: L.E. 3
- Annual cost of personnel: L.E. 87,851(48% of total annual expenditure)
- Annual cost of drugs and medical supplies: L.E. 56,990(31% of total annual expenditure)

Efficiency Indicators

- Annual visits: 65,747
- Annual number of visits per physician: 4,383
- Average number of visits per physician per day: 16
- Annual number of visits per staff: 678

PHCF Staff

- Total number of staff: 97
- Number of physicians: 15, accounting for 18 % of total annual personnel expenditures
- Number of Nurses: 23, accounting for 23% of total annual personnel expenditures

Arbeen Urban Health Center is a good example for Primary Health Care Facility efficiency because of the following reasons:

- It has the highest utilization rate (65,747 visits per year)
- The cost per visit is the lowest (L.E. 3). See Graph 3 for cost per year in outpatient health
- facilities.
- The budget for drugs is 31 percent of the total annual expenditures. This is relatively high, but because of the high utilization rate, the drugs cost per visit is L.E. 0.87. See Graph 1-3 for total annual visits compared to the cost of drugs per visit.

Based on cost per visit, Arbeen is the most efficiently operated outpatient health facility of all those assessed. This cost analysis does not provide an indication of quality of care provided. However, the cost of drugs per visit is among the lowest. The quality of care provided would increase if drugs would be available and the out-of-pocket costs for patients would decrease.

Name of health facility: Sabah

Type of health facility: Urban Health Center

Governorate: Suez

See tables: 103,104,105,106, 107 and 108

Cost Analysis

- Total annual cost: L.E. 392,540
- Cost per visit: L.E. 9
- Annual cost of personnel: L.E. 227,872 (58% of total annual expenditure)
- Annual cost of drugs and medical supplies: L.E. 121,715 (31% of total annual expenditure)

Efficiency Indicators

- Annual visits: 45,370
- Annual number of visits per physician: 1,973
- Average number of visits per physician per day: 7
- Annual number of visits per staff: 307

PHCF Staff

- Total number of staff: 148
- Number of physicians: 23, accounting for 20 % of total annual personnel expenditures
- Number of Nurses: 56, accounting for 37% of total annual personnel expenditures

Sabah Urban Health Center has one of the largest number of staff (148) of the facilities assessed, second only to Kabary (273). The number of physicians is 23 with an average of 7 visits per day per physician. The annual drug budget is 31% of the annual expenditure (the same as in Arbeen UHC), but because of the lower utilization rate for Sabah UHC, the cost of drugs is L.E. 3 per visit, which is three times the cost of drugs in Arbeen UHC.

To increase the efficiency of Sabah UHC:

- Increase the utilization rate.
- Increase the number of personnel.
- Increase the budget for drugs.

Name of health facility: El Eman

Type of health facility: Urban Health Center

Governorate: Suez

See tables: 109,110,111,112,113,114 and 115

Cost Analysis

- Total annual cost: L.E. 255,422
- Cost per visit: L.E. 7
- Annual cost of personnel: L.E. 149,111(58% of total annual expenditure)
- Annual cost of drugs and medical supplies: L.E. 46,209(18% of total annual expenditure)

Efficiency Indicators

- Annual visits: 36,097
- Annual number of visits per physician: 1,641
- Average number of visits per physician per day: 6
- Annual number of visits per staff: 334

PHCF Staff

- Total number of staff: 108
- Number of physicians: 23, accounting for 23 % of total annual personnel expenditures
- Number of Nurses: 37, accounting for 34% of total annual personnel expenditures

The total cost per visit at El Eman UHC is L.E. 7, one of the lowest costs per visit. The lowest cost per visit was calculated at L.E. 3 per visit in Arbeen UHC. The personnel cost per visit is L.E. 4. The physicians account for 20 percent or L.E. 0.8, while nurses account for 34 percent (L.E. 1.48). Total number of personnel is 108, including 28 physicians with an average of 6 visits per physician per day. Drug cost per visit is only L.E. 1.

To increase the efficiency of El Eman UHC:

- Increase the annual budget for drugs.
- Decrease the number of personnel, especially the physicians and nurses.

Name of health facility: Moharam Bek

Type of health facility: Maternal and Child Health Center

Governorate: Alexandria

See tables: 116,117,118,119,120, 121 and 122

Cost Analysis

- Total annual cost of PHC: L.E. 494,507
- Cost per visit: L.E. 37
- Annual cost of personnel: L.E. 355,358 (72% of total annual expenditure)
- Annual cost of drugs and medical supplies: L.E. 94,987(19% of total annual expenditure)

Efficiency Indicators

- Annual visits: 13,394
- Annual number of visits per physician: 227
- Average number of visits per physician per day: 1
- Annual number of visits per staff: 93

PHCF Staff

- Total number of staff: 144
- Number of physicians: 59, accounting for 43 % of total annual personnel expenditures
- Number of Nurses: 45, accounting for 28% of total annual personnel expenditures

Moharam Bek MCH has 57 physicians and a low utilization rate at 13,394 visits annually. This results in the lowest rate of visits per physician, or one visit per physician per day. Comparing Moharam Bek MCH with Amer RHU in both the utilization rate and number of physicians, the annual number of visits at Amer RHU is 3,000 visits more than those at Moharam Bek MCH, while the number of physicians at Amer RHU is only 3% of the number of physicians at Moharam Bek MCH. See table 5 for personnel costs. As a result of this low utilization rate, the cost per visit is very high at L.E. 37 and physicians account for 43 percent of the visit cost. The cost of drugs per visit is L.E. 7. This high cost is not the result of the high annual drug budget which constitutes only 19% of the total annual budget, but is directly related to the low utilization rate. See table 2 for distribution of visit cost by category.

To increase the efficiency of Moharam Bek MCH:

- Decrease the number of physicians by more than 90%.
- Increase the utilization rate.

Name of health facility: Mosalas

Type of health facility: Maternal and Child Health Center

Governorate: Suez

See tables: 123,124,125, 126, 127,128 and 129

Cost Analysis

- Total annual cost of the PHC: L.E. 62,797
- Cost per visit: L.E. 22

- Annual cost of personnel: L.E. 46,452 (74% of total annual expenditure)

- Annual cost of drugs and medical supplies: L.E. 4,438(7% of total annual expenditure)

Efficiency Indicators

- Annual visits: 2,833

- Annual number of visits per physician: 2,833

- Average number of visits per physician per day: 10

- Annual number of visits per staff: 101

PHCF Staff

- Total number of staff: 28

- Number of physicians: 1, accounting for 7 % of total annual personnel expenditures

- Number of Nurses: 8, accounting for 25% of total annual personnel expenditures

Mosalas MCH has only one physician and 14 staff in nursing and administrative positions accounting for 54% of the total annual budget for personnel. The cost per visit is L.E. 22 of which personnel accounts for 74% and drugs 7%. See Table 2 for annual personnel cost per visit. See Table 3 for personnel costs. Drugs cost L.E. 7 per visit.

To increase the efficiency of Mosalas MCH:

- Decrease the number of personnel, especially those who are working in administration.
- Increase the utilization rate

- Increase the annual drug budget.

Name of health facility: Ahnasia

Type of health facility: Maternal and Child Health Center

Governorate: Bani Suef

See tables: 130,131,132, 133, 134, 135 and 136

Cost Analysis

- Total annual cost: L.E. 103,159

- Cost per visit: L.E. 25

- Annual cost of personnel: L.E. 68,117 (66% of total annual expenditure)

· Annual cost of drugs and medical supplies: L.E. 2,656 (3% of total annual expenditure)

Efficiency Indicators

· Annual visits: 6,400

· Annual number of visits per physician: 675

· Average number of visits per physician per day: 2

· Annual number of visits per staff: 176

PHCF Staff

· Total number of staff: 23

· Number of physicians: 6, accounting for 27 % of total annual personnel expenditures

· Number of Nurses: 7, accounting for 39% of total annual personnel expenditures

The number of daily visits is 2 per physician, one of the lowest rates. See Graph 5 for daily outpatient visits per physician. The total number of personnel is 23 consuming 66% of the total annual budget. Nurses account for 39% of the personnel budget. This high personnel number and the low utilization rate results in high cost per visit (L.E. 25). Drugs account for 3 percent of the total annual budget costing L.E. 0.66 per visit.

To increase the efficiency of Ahnasia MCH:

· Decrease the total number of personnel, especially the number of physicians.

· Increase the drug budget.

· Increase the utilization rate.

IV. Recommendations

The foregoing analysis shows an urgent need to significantly strengthen the organization and delivery of primary health care services in order to sustain improvements in efficiency. This study assessed costs of primary health facilities; however, it is obvious that quality is also low. The drug budgets are very low in many units and physicians may be present only a few days per week. Poor quality of primary health care is a result of many factors including resource constraints, inadequately trained staff, lack of accountability, lack of a clearly defined package of services, highly centralized planning, and a lack of community participation.

The quality and reliability of services provided in primary health care facilities is critical to the overall functioning of the referral network. If the patients have serious doubts that they will obtain the services they desire at a basic hospital, they may bypass their local lower-cost providers and refer themselves directly to tertiary and secondary centers. The cost per visit ranged between L.E. 3 and L.E. 60 for rural health units (depending on utilization rate) versus L.E. 5.30 for outpatient visits at general hospitals in Alexandra, Suez and Bani Suef Governorates.

Such activity adds to economic inefficiency in the delivery system--tertiary facilities became overcrowded with basic cases, the fixed inputs of basic hospitals are underused, and patients incur travel and waiting costs that would have been avoided if local facilities provided a reliable supply of adequate quality services. Any improvement in quality that shifts demand for basic services to basic facilities will result in the more economically efficient use of health sector resources and allow for greater coverage than was previously possible.

A recent WHO study published on 1995 (Improving the Performance of Reference Health Centers in Urban Areas) included factors affecting utilization at health centers in Cairo. "Health centers in Cairo were better utilized because of cleanliness (64.3%), good performance of the doctors (40.8%), and geographical accessibility of health center (32.1%). However, the users were concerned about the non-availability of drugs (64.6%) and the absence of the 24-hour emergency services (40.4%) for health centers at Cairo." (WHO/SHS/DHS/95.3)

Achieving a balance between demand and service availability at each level of health service depends on a system of relative prices, fee penalties for non-referred entry at upper levels, and enforcement of referrals that is in balance with the quality of services. Implementation of improved referral policies is facilitated by a district and regional health management structure that includes both primary and secondary care under a common administrative and financial unit responsible for all health facilities and programs in the region.

To reinforce the role of primary health care in national health policy and planning, enabling legislation is needed, accompanied by the necessary regulatory changes to facilitate flexible administrative and human resources management. Staff at the local level need to be more highly valued, and measures found to appropriately raise their status. Primary health care, as a philosophy and approach, remains abidingly relevant. Primary health care, however, must develop and adapt the most effective tools to meet evolving circumstances.

Egypt can get better value for money spent on health care. The question remains how this can be achieved, especially in the area of primary health care. With the general strategy of the MOHP to cover the nation with health facilities, these facilities in some areas are considered to be superfluous, especially in the metropolitan urban areas such as Cairo Governorate. This raises the question of quality of care for more cost effectiveness and efficiency of services. For insuring an acceptable standard of care at both levels, "primary and secondary", it is important to specify the role of each in the health system and to make the volume of work match the available resources and capabilities.

The accessibility to primary health care is not a major problem; more than 90 percent of the population lives within 5 kilometers of a clinic, and on average there is one doctor and over two nurses for every five thousand people. There are almost three thousand rural clinics and nearly eight hundred urban clinics.

The primary health units vary in utilization and costs per visit. The average cost per visit is more than 70 percent of the units was more than L.E. 10 per visit, while the cost per visit in the most efficient unit, Arbeen, was only L.E. 3 per visit. In the cost analysis of general hospitals in the three Governorates, the average cost per outpatient was L.E. 5. Since the major determinant of cost per visit is utilization, efficiency could be improved if utilization increased. Many of the primary health clinics are poorly maintained, underutilized, and operating inefficiently.

From this cost study and from observations made during visits to the units, several strategies for increasing utilization include:

1. Improving cleanliness and hygiene in the clinics as many (but not by means all) of the units are dirty and in poor repair, largely resulting from the low budget for maintenance.

2. Improving the drug supply. The units are supposed to be stocked with drugs so that most patients do not have to purchase drugs from pharmacies. However, from the low drug cost per visit where 25 percent of visits have less than L.E. 1 per visit and an additional 44 percent have between L.E. 3 and 4 per visit, it is obvious that the drug supplies are inadequate for the number of patients. See graph 2 for total annual visits against drugs cost per visit.

3. Other studies, primarily from the child survival project, have demonstrated the need for improved skills among the health workers. If quality of care improved from improved skills of the health workers, better drugs supplies and improved equipment maintenance and supplies, utilization would likely increase.

4. In some areas, primary health facilities exist in close proximity to one another or to easy public transport to hospitals. Closing some of the underutilized health services would increase the utilization of those remaining, or increase utilization of the outpatient departments of the general hospitals where the costs per visit of L.E. 5 is much less than the majority of the units studied.

5. Changing staffing patterns at the primary health units based on utilization; decreasing the number of physicians, nurses and administrative staff in some of the units. The number of daily visits per physician varies from 1 to 30. The number of administrative staff per rural health unit varies from 2 to 23. The tasks of these staff include: birth and mortality registration, endemic disease surveillance, and water quality purity surveillance.

6. Developing treatment guidelines. A major issue that needs to be addressed in order to improve quality, efficiency and efficacy of the system is to develop appropriate treatment guidelines for interventions. Estimates of what constitutes "appropriate treatment in an Egyptian context" will be developed through studies, international practice patterns, and discussions with experts. These can then be compared with what is actually occurring in MOHP facilities. The comparison will identify areas for attention and help develop specific initiatives to redress the situation. This comparison can contribute to developing standards for the delivery of quality outpatient and inpatient services.

Two important questions concerning utilization of health services should be addressed before investing in upgrading public primary health units or closing underutilized units:

1. Is there an unmet demand for health services so that increasing the quality of health services would increase utilization?

2. Would an increasing utilization of public primary health services translate into improved health outcomes?

From the Department of Planning/Data for Decision Making Household survey in 1995, the average outpatient contacts per capita were 5.7 for urban populations and 3.51 for rural populations. This includes utilization by both the private and public sectors. The lowest income quintile of the population uses 2.7 outpatient visits per capita, while the highest income quintile uses 6.6 visit per capita with similar rural and urban difference. The population with the lowest utilization is the poor of upper rural Egypt. Changing utilization will entail increasing the quality of health services and removing the financial barriers of the need to purchase drugs and a ticket to travel to receive services from the health unit. However, from this cost analysis alone, it is difficult to address question number two.

The Ministry of Health and Population is currently discussing health sector reform and different types of health insurance financing and provision schemes to improve efficiency, quality, coverage and health status. Increasing efficiency of these primary health units will be an essential part of any scheme.

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Annex I: Text Figures

Annex II: Text Tables

Annex III: Definitions and Data Notes

Allocative efficiency: The extent of optimality reached in the distribution of resources among a number of competing uses.

Ancillary service cost: These include the cost of all cost centers in intermediate service departments except kitchen and laundry cost centers.

Annual values: Values of the use of capital items for health services, such as equipment, vehicles and building, for one year.

Average cost (unit cost): Defined as the total cost divided by number of units of output, e.g., cost per admission, cost per patient-day and cost per outpatient visit. Similarly, marginal cost is the additional cost required to produce one more unit of output.

Costs: The products of price (or unit costs) and the number of units consumed (or service intensity). The higher the average level of unit costs, the more important the variation in service intensity.

Cost analysis:

Capital cost: The annual cost of resources that have a life expectancy of more than one year, e.g., buildings, equipment and vehicles. Staff training also can be classified as capital cost if the new skills are expected to last for one year or more. The costs of refresher training courses that occur throughout the year should be classified as recurrent.

Cost Center:

Cost-effectiveness analysis: The technique used for identifying which health interventions achieve the greatest level of health impact per unit of investment.

Disability-adjusted life year (DALY): The unit used for measuring both the global burden of disease and the effectiveness of health interventions, as indicated by reductions in the disease burden. It is calculated as the present value of the future years of disability-free life that are lost as the result of the premature deaths or cases of disability occurring in a practical year.

Direct costs of department: The costs attributed to each cost center prior to the allocation of the cost centers associated with hospital outputs.

Equipment operation and maintenance: Cost of maintaining equipment in operating order.

Economic efficiency: Economic inefficiency occurs when the hospital is not using the least expensive combination of inputs for a given output (Barnum 1993).

Economic cost: Presents the opportunity cost of using resources and inputs in one intervention rather in their next best intervention use. More formally, it is the payment required to keep that input in its present employment, or… the remuneration the input would receive in its best alternative employment (Nicholson, W., Microeconomics Theory: Basic Principles and Extensions, Fourth Edition, Dryden Press, New York, 1989, p. 309).

Financial cost: The actual expenditures or outlays made for a specific intervention.

Full-time equivalent (FTE) physician: FTE was calculated by dividing each physician's work by specialty by the ratio of his/her work in outpatient clinics, inpatient departments, operation

theaters and the emergency unit (table 6 presents the percentage of working time per activity for physicians for each department).

Intermediate service departments: Intermediate service departments are those that offer services both directly to patients and to other final medical departments. Examples include: operating theaters, laboratory and X-ray. In this analysis, kitchen and laundry departments were also included in the intermediate category because costs in these centers were estimated and distributed in a way similar to those of other intermediate departments.

Intervention (in health): A specific activity meant to reduce disease risks, treat illness, or palliate the consequences of disease and disability.

Number of nurses per FTE physician: Measures the number of nurses working with a full-time physician.

= Total number of nurses/total number of FTE physicians

Overhead departments: Cost centers which produce only those services that are consumed by other departments (cost centers) of the hospitals, not by patients. Examples include: maintenance, legal affairs and finance.

Overhead cost: These costs remain essentially constant regardless of whether a bed is occupied.

Personnel cost: Value of labor, including health professionals, administrative staff, and non-health personnel (e.g., drivers), used to provide health services during the reference period during the reference period.

Present value (current values): Estimates the current value of the capital item – the amount you would have to pay to purchase a similar item at the present time (the replacement value rather than the original price). It is the market value of the item e.g., equipment, square meter of constructions (WHO cost analysis manual 1992).

Personnel cost: Value of labor, including health professionals, administrative staff, and non-health personnel (e.g., drivers), used to provide health services during the reference period.

Per Diem: Cost of daily stipends for health workers involved in supervision activities.

Reference time: The period of data collection for costing of the health facilities from July 1, 1993 to June 30, 1994.

Recurrent cost: The cost associated with inputs that will be consumed or replaced in one year or less, for example, staff salaries, utilities, drugs and medical supplies.

Technical efficiency: The extent to which choice and utilization of input of resources produces a specific health output, intervention or service at the lowest cost (WDR 1993).

Tertiary-based health services: A hospital or other health facility that offers a specialized, highly technical level of health care for the population of a large region. Characteristics include specialized intensive care units, advanced diagnostic support services and highly specialized personnel.

Useful life: Estimates the number of years of useful life the item realistically can be expected to have after being acquire

Annex IV: Data Sources

I. Primary Health Care facility Cost

A. Capital Cost

1. Building space:

- Engineering Department
- Maintenance Department

2. Equipment, vehicles and furniture:

- Physical inventory
- Log books no. 118, 112, and 121
- List of received items for nurses at different departments.
- Purchase dept. at health directorate.

B. Recurrent Cost

1. Personnel:

- Sheet no. 132 A.H.
- Sheet no. 50 A.H.
- Log book for salary
- Personnel Department

2. Drugs and medical supplies:

- Log book for inpatient, outpatient and emergency pharmacies

3. Utilities, include

- Water: Receipts for water
- Electricity: Receipts for electricity
- Telephone: Receipts for telephone
- Gas: Receipts for gas
- Benzene, oil: Receipt for benzene and oil

4. Others, include

- Food: Receipts for food
- Stationery: Receipts for stationery

5. Maintenance, include:

    - Building: Receipt for maintenance
    - Equipment: Receipt for maintenance
    - Vehicle: Receipt for maintenance

II. Primary Health Care facility Statistics

Surgical procedures: Log book for operation theaters for 1993-94.

Lab tests: Log book for inpatient laboratory for 1993-94.

X ray: Log book for radiology department.

Annex V: Data Collection Forms